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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,108	03/16/2005	Tadayoshi Ito	038440-0119	9116

22428 7590 03/20/2009

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EXAMINER	
HERRERA, DIEGO D	

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
03/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,108	ITO ET AL.	
	Examiner	Art Unit	
	DIEGO HERRERA	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 12/12/2008 was filed. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Response to Amendment

Claims 1-7, 10, 13, and 16 have been amended.

Claims 19-24 have been added as new claims.

Claim Objections

Claims 1-24 are objected to because of the following informalities: the word "capable of" renders that limitation problematic since anything could be capable of it does not necessarily means that it does. Appropriate correction is required.

Response to Arguments

Applicant's arguments filed 2/9/2009 and 1/5/2009 have been fully considered but they are not persuasive. In regards to applicant's arguments and remarks, wherein claims 1-24 disclose reference signal allocation unit for allocating by switching the reference signals that have been allocated to the personal stations establishing SDMA respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, reads on the cited references of Doi and Ishida.

As the reference of Doi teaches maintaining communication quality as the system and mobile stations for the system increase in number can connect to the same

frequency resource, abstract. The reference of Ishida teaches that of, "the directivity pattern is controlled so as to separate a signal, which has been sent from a desired mobile station, from data into which a plurality of signals of other mobile stations are multiplexed." And further explained in paragraphs: 14-16, 18-24, wherein the reference of Ishida teaches multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed. Therefore, the claims are written broadly that the references of Doi and Ishida read on the limitations of Ito et al..

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi (US publication 20020039886), and in view of Ishida (US publication 20010019952).

Regarding claim 1. Doi discloses a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), one or more reference signals, optimized for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus, being defined in said radio cell station apparatus (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), comprising:

a multiplexed connection number detection unit for detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division

multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

a reference signal allocation unit for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection unit. However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for

allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Regarding claim 4. Doi discloses a personal station establishing space division multiple access to a radio cell station apparatus (paragraph [0025], Doi teaches the disclosure that of a radio communication system and mobile devices), one or more reference signals, optimized for each multiplexed connection number of the personal station establishing said space division multiple access to said radio cell station apparatus, being defined in said radio cell station apparatus (paragraph [0026], Doi teaches the mobile device communicating with radio base station), comprising:

a receiving unit for receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received by antenna of base station and establishing division multiple access); and

a switching unit for switching the reference signal to a reference signal capable of maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus; However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when

change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Regarding claim 7. Doi discloses a method of controlling a reference signal performed by a radio cell station apparatus to which a plurality of personal stations can establish space division multiple access(fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said radio cell station apparatus transmitting to and receiving from each of said plurality of personal stations a signal including an already known reference signal different for each personal station one or more reference signals being defined for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), comprising the steps of:

detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

when change in the number of multiplexed connections is detected in said step of detecting the number of multiplexed connections, switching the reference signals that have been allocated to the personal stations establishing space division multiple access

respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, and allocating the reference signals to said plurality of personal stations respectively; However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when

change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Regarding claim 10. Doi discloses a method of controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus (paragraph [0025], Doi teaches the disclosure that of a radio communication system and mobile devices), one or more reference signals, optimized being defined for each multiplexed connection number of the personal station establishing said space division multiple access to said radio cell station apparatus, being defined in said radio cell station apparatus (paragraph [0026], Doi teaches the mobile device communicating with radio base station), comprising the steps of: receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received by antenna of base station and establishing division multiple access); and switching the reference signal to a reference signal capable of maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus; However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the

personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Regarding claim 13. Doi discloses a computer program embodied in a computer readable medium, for controlling a reference signal performed by a radio cell station

apparatus to which a plurality of personal stations can establish space division multiple access (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said radio cell station apparatus transmitting to and receiving from each of said plurality of personal stations a signal including an already known reference signal different for each personal station one or more reference signals being defined for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus (paragraph [0032], [0058], Doi teaches a reference signal which is a basis for forming the antenna directivity), causing a computer to execute the steps of:

detecting number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD); and

when change in the number of multiplexed connections is detected in said step of detecting the number of multiplexed connections, switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, and allocating the reference signals to said plurality of personal stations respectively; However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that

have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means, nevertheless, Ishida teaches reference signal allocation means (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection means as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Regarding claim 16. Doi discloses a computer program embodied in a computer readable medium, for controlling a reference signal performed by a personal station establishing space division multiple access to a radio cell station apparatus (fig. 8, paragraph [0003], [0026], [0080], [0089], Doi teaches establishing from a mobile device to a radio cell station to a TDMA/TDD frame and simultaneously provision), said personal station transmitting to and receiving from said radio cell station apparatus a signal including an already known reference signal different for each personal station one or more reference signals being defined for each multiplexed connection number of the personal stations establishing said space division multiple access to said radio cell station apparatus (paragraph [0026], Doi teaches the mobile device communicating with radio base station), causing a computer to execute the steps of:

receiving a request for switching a reference signal from said radio cell station apparatus in accordance with change in the number of multiplexed connections of the personal stations establishing space division multiple access (abstract, paragraph [0029], [0058], [0066], [0093], and [0094], Doi teaches reference signal being received by antenna of base station and establishing division multiple access); and

switching the reference signal to a reference signal capable of maintaining communication quality even after the number of multiplexed connections is changed and transmitting a response to the request for switching to said radio cell station apparatus.

However, Doi does not discloses specifically reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal

stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection unit, nevertheless, Ishida teaches reference signal allocation unit (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to specifically include reference signal allocation means for allocating, by switching the reference signals that have been allocated to the personal stations establishing space division multiple access respectively prior to change in the number of multiplexed connections to reference signals capable of maintaining communication quality even after the number of multiplexed connections is changed, the switched reference signals to said plurality of personal stations respectively, when change in the number of multiplexed connections is detected in said multiplexed connection number detection unit as taught by Ishida for the purposes of controlling unit updates and to transmit a channel assignment notification that specifies time slot and frequency and assigned channel.

Consider claim 2. The radio cell station apparatus according to claim 1, the combination discloses further comprising storage means for storing a reference signal

optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, said reference signal allocation means selects reference signals optimal for the changed number of multiplexed connections from said storage means and allocates the selected reference signals to said plurality of personal stations respectively (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

Consider claim 3. The radio cell station apparatus according to claim 2, Wherein said reference signal stored in said storage means unit is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0056], [0058], Doi teaches the storing reference signal).

Consider claim 5. The personal station according to claim 4, further comprising a storage means unit for storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a

reference signal optimal for the changed number of multiplexed connections is selected from said storage unit and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus (fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station, ¶: 4-6, 24, Ishida teaches SDM communication).

Consider claim 6. The personal station according to claim 5, The combination discloses wherein said reference signal stored in said storage means is calculated for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

Consider claim 8. The method of controlling a reference signal according to claim 7, the combination discloses further comprising the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal stations respectively(paragraph [0025]-[0028], and

[0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

Consider claim 9. The method of controlling a reference signal according to claim 8, the combination discloses wherein the step of storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access further includes the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

Consider claim 11. The method of controlling a reference signal according to claim 10, the combination discloses further comprising the step of storing a reference signal optimized (paragraph [0056], [0058], Doi teaches the storing reference signal) for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus (fig. 4, paragraph [0078], [0087], [0092]-

[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Consider claim 12. The method of controlling a reference signal according to claim 11, the combination discloses wherein the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing reference signal) establishing space division multiple access further includes the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

Consider claim 14. The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 13, the combination discloses further causing the computer to execute the step of storing a reference signal optimized for each number of multiplexed connections of the personal stations establishing space division multiple access (paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-6, 24, Ishida teaches SDM communication), wherein when the number of multiplexed connections of the personal stations establishing space division multiple access is changed, reference signals optimal for the changed number of multiplexed connections that have been stored are selected and the selected reference signals are allocated to said plurality of personal

stations respectively (paragraph [0025]-[0028], and [0032], Doi teaches radio information calculating data for controlling antenna directivity and reception unit forming and using calculating data).

Consider claim 15. The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 14, the combination discloses wherein the step of:

storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing reference signal, ¶: 4-6, 24, Ishida teaches SDM communication) establishing space division multiple access further causes the computer to execute the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

Consider claim 17. The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 16, the combination discloses further causing the computer to execute the step of:

storing a reference signal optimized (paragraph [0056], [0058], [0102], Doi teaches the storing reference signal also adjusting the signal of one mobile station so it can be transmitted and received optimally) for each number of multiplexed connections of the personal stations establishing space division multiple access(paragraph [0025]-[0027], Doi teaches communication between base station and mobile device or apparatus, ¶: 4-

6, 24, Ishida teaches SDM communication), wherein when the request for switching the reference signal is received from said radio cell station apparatus, a reference signal optimal for the changed number of multiplexed connections that has been stored is selected and a response to the request for switching including the selected reference signal is transmitted to said radio cell station apparatus(fig. 4, paragraph [0078], [0087], [0092]-[0093], Ishida teaches allocation channel assignment notification contains the associated UW and notifies that the link channel has been assigned to the mobile station).

Consider claim 18. The computer program embodied in a computer readable medium, for controlling a reference signal according to claim 17, the combination discloses wherein the step of:

storing a reference signal optimized for each number of multiplexed connections of the personal stations (paragraph [0056], [0058], Doi teaches the storing reference signal) establishing space division multiple access (¶: 4-6, 24, Ishida teaches SDM communication) further causes the computer to execute the step of calculating a reference signal for each number of multiplexed connections based on a high autocorrelation characteristic and a low cross-correlation characteristic (paragraph [0032], [0085], [0089], Doi teaches the radio base station path division multiplexes a maximum of four signals on the same frequency in addition to TDMA/TDD).

Consider claim 19. The radio cell station apparatus according to claim 1, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple

access can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Consider claim 20. The personal station according to claim 4, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Consider claim 21. The method of controlling a reference signal according to claim 7, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Consider claim 22. The method of controlling a reference signal according to claim 10, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Consider claim 23. The computer program, embodied in a computer readable medium, for controlling a reference signal according to claim 13, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access

can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Consider claim 24. The computer program, embodied in a computer readable medium, for controlling a reference signal according to claim 16, wherein an optimal reference signal pattern for each multiplexed connection number is defined on condition that each signal for said personal station establishing space division multiple access can be separated and extracted in a stable manner (¶: 19-22, Ishida teaches separating and extracting signal from SDMA).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIEGO HERRERA whose telephone number is (571)272-0907. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Diego Herrera/
Examiner, Art Unit 2617

/Lester Kincaid/
Supervisory Patent Examiner, Art Unit 2617